

SECTION 610 ROADSIDE RE-VEGETATION

610.01 DESCRIPTION. This work is re-establishing vegetative cover on specified areas by topsoiling, seeding, planting, fertilizing, mulching, soil retention blankets, and sodding.

610.02 MATERIALS. Furnish materials meeting the following requirements.

Water	Subsection 713.01
Topsoil	Subsection 713.05
Seed	Subsection 713.08
Fertilizer	Subsection 713.09
Mulch	Subsection 713.10
Sod	Subsection 713.11
Soil Retention Blankets	Subsection 713.12

610.03 CONSTRUCTION REQUIREMENTS.

610.03.1 Topsoiling. Furnish topsoil and pay all royalty, development, smoothing and leveling costs of topsoil removal.

Notify the Project Manager of the proposed topsoil source(s) as soon as possible after the Contract award. Topsoil from proposed sources may be used only after sample tests show the material is acceptable.

Complete topsoil areas to the lines, grades, and elevations specified. Do not place topsoil until the designated areas are prepared and all construction work in the area is completed.

Scarify or rip slopes to be topsoiled.

Break up ordinary sod and soil containing grass roots into maximum 2-inch (50 mm) clumps.

Remove and dispose of all large clods, rocks, large roots, litter, and other foreign material in spread topsoil at Contractor expense. Break up the topsoil to an average depth of 4-inches (105 mm).

610.03.2 Seeding, Fertilizing, and Mulching. These requirements apply to establishing vegetation on areas disturbed by the work. Landscaping interchange areas, rest areas, urban areas, and other areas are specified elsewhere in the Contract.

A. General. Work the areas to be seeded to the specified line and grade before seeding and fertilizing.

Seed all disturbed areas. Permanent seeding of the finished slopes may require multiple seeding. Fertilizing, mulching, permanent erosion control placement, and seeding are specified in the Contract.

B. Seeding Season. The seeding season is October 15 through May 1. Obtain the Department Agronomists approval to seed outside this period.

- C. Conditioning Seedbed Surface.** Condition the seedbed surface area by killing growing weeds, removing or mowing old weedy growth, tilling, discing, harrowing, or scarifying compacted areas, and compacting unstable areas.

Condition all seeding areas unless otherwise directed. The Project Manager may exclude wet, soft or rocky areas from conditioning.

Cultivating, tilling, harrowing, discing, and similar work may, if approved, be performed any time after the Contract is awarded.

Break up tight or compacted soils into 2-inch (50 mm) or smaller pieces. Remove or repair discs, harrows, cultipackers, and similar equipment not in good operating condition. Operate discing, harrowing, and soil tilling equipment at right angles to the natural slopes.

Prepare soil using equipment that produces a rough-textured surface ready for seeding and mulching. Operate equipment normal to the natural slopes. The final surface must be 1 to 1½-inches (25 to 40 mm) below the tops of curbs, catch basins, and other structures.

Rescarify areas to be broadcast seeded within 48 hours before seeding.

D. Seed Distribution.

1. **General.** Apply seed within 48 hours of the final seedbed conditioning.

Do not broadcast seed or hydraulic seed when weather conditions prevent uniform seed distribution.

Do not cover seed with more than 1/2-inch (13 mm) of soil.

The seed application rate is specified in the Contract.

2. **Drill Seeding.** Drill seed slopes 3:1 and flatter using equipment that regulates the seed application rate and planting depth. Acceptable drills are custom seeders, furrow drills, disc drills, or other approved drills. If seed sowing equipment does not have press wheels, compact the seed using a cultipacker once the ground has been drilled.

Maintain uniform seed distribution in the drill hopper during the work.

Operate all seeding related equipment at right angles to the slope.

Regulate planting depth with depth bands or coulters. Use a drill box partitioned by dividers a maximum 24-inches (610 mm) apart.

Seed rows a maximum 8-inches (205 mm) apart and at right angles to the slope.

3. **Broadcast Seeding.** Hand seeding or mechanical seeding of slopes exceeding a 3:1 slope, narrow medians, or small areas is permissible.

4. **Hydraulic Seeding.** Hydraulic seeding is permissible for slopes steeper than 3:1 or when the seedbed surface is impractical to drill seed.

Perform hydraulic seeding in two operations.

- a. Apply the seed with 1 pound (0.454 kg) of wood or recycled paper mulch per 3 gallons (11.3 L) of water.

- b. Apply the remaining mulch, along with fertilizer, if specified. See Subsection 610.03 (F)(5).

- E. Application of Fertilizer.** When broadcasting seed, apply the fertilizer separately.

When drill seeding do not apply seed and fertilizer in a single mixture. The fertilizer must be applied separately, either broadcast before seed application, or surface banded during seeding.

F. Mulching.

1. General. Use the mulch type specified in the Contract.

Apply mulch to seeded areas within 24 hours after seeding without disturbing the seedbed surface.

Do not apply mulch to ground having free surface water or if wind prevents uniform distribution.

2. Application of Vegetative Mulch. Uniformly apply vegetative mulch with a mulch spreader at the specified rate once seeding and fertilizing are completed.

Secure all vegetative mulch to the slopes with a non-asphalt based tackifier containing either plant derived hydrocolloid or polymeric materials. Add the tackifier to the fertilizer/mulch slurry when wood cellulose or recycled paper fibers are used as an over-spray onto the straw/hay mulch.

Tuck vegetative mulch on slopes 3:1 or flatter into the seedbed. Use a mulch tiller for tucking. Operate the equipment perpendicular to the slope.

Use mulch tillers having round, notched blades approximately 1/4-inch (6 mm) thick by 18-inches (460 mm) in diameter spaced 8-inches (205 mm) apart that force the vegetative mulch at least 3-inches (75 mm) into the soil. Equip tillers with disc scrapers.

If temporary erosion controls are needed, straw tucking followed by permanent seeding within the seeding season are acceptable measures.

3. Applying Fabricated Mulch or Netting. Place fabricated mulch or netting on the specified or directed areas, securing it to the ground using wire staples, wood pegs, or other approved devices. Apply the mulch or netting over the seeded areas.

4. Applying Wood Cellulose Fiber or Recycled Paper Mulch. Apply wood cellulose fiber or recycled paper mulch and fertilizer in one operation with a hydraulic distributor using water as the vehicle. Equip the distributor with a continuous agitator keeping the fertilizer and mulch uniformly suspended throughout the distribution cycle. Adjust the pump pressure to maintain a continuous slurry stream. Size the slurry distribution lines to prevent plugging. Equip the discharge line with hydraulic spray nozzles to uniformly distribute the slurry to the seedbed.

Start mulching at the top of the slope and work downward. Use extension hoses to reach the slope extremities.

5. Finishing. Re-mulch areas where mulch is weather damaged.

Repair seedbed and seeding damage caused by displaced mulch material and re-seed the areas before re-mulching. Seedbed repair, re-seeding, and re-mulching required due to the Contractor's negligence is at Contractor expense.

610.03.3 Sodding.

- A. Season.** Perform sodding during the normal seeding season or as specified.
- B. Source of Materials.** Notify the Project Manager of the sod source(s) at least three days before sod cutting begins. Cut and deliver only approved sod to the project.
- C. Surface Preparation.** Prepare the surfaces to be sodded to the required cross section, grade, and contour. Make the surface smooth and uniform, free of stones, roots, lumps, weeds, and other foreign material. Undercut the prepared surface below the adjacent areas so the top of the new sod is flush with adjacent seedbed or turfed areas and 1-inch (25 mm) below sidewalk and curb tops.
- Break the surface up to a fine, granular texture at least 2-inches (50 mm) deep before placing sod.
- Fertilize the surface to be sodded a maximum 48 hours before placing sod. Use inorganic fertilizer having minimum active ingredients of 15 pounds (7 kg) of Nitrogen and 40 pounds (18 kg) of P_2O_5 per acre (17 kg Nitrogen, 44 kg P_2O_5 per hectare).
- D. Cutting and Handling Sod.** Machine-cut sod in uniform rectangular sections.
- Cut sod to a depth that retains intact, the grasses live dense root system and prevents tearing or breaking of the sod.
- Load, unload, and place sod to prevent tearing or breaking of the sod.
- E. Placing Sod.** Lay sod within 36 hours of cutting. Protect sod from dry or cold weather until placed.
- Place and fit sod as close as possible staggering the joints between horizontal rows.
- Lay the sod strips horizontally on slopes, starting at the slope bottom and work upwards. On slopes steeper than 3:1, anchor the sod with fasteners spaced a maximum 2 feet (610 mm) apart and driven flush with the sod surface.
- In waterways, lay the strips parallel to the flow, staggered, and fitted snug and even with the strips already placed.
- Fill gaps between sod strips with sod pieces cut to the gap size and shape.
- At slope bottoms, extend the sod edges at least 2-inches (50 mm) into the ground or ditch bottom. Turn all other sod area edges into the ground and cover with topsoil, compact and smooth to blend with the adjacent finished grades.
- Roller compact the sod with a roller immediately after placement. Provide a smooth, even surface, free from bumps and depressions.
- Thoroughly water the sod and re-roll to insure good soil contact.
- F. Sod Maintenance.** Water new sodded areas until the sod is firmly rooted. Maintain the new sod until it is well rooted and replace all dead, dying, and damaged sod as directed at Contractor expense.

610.03.4 Erosion Control Blanket. Prepare, fertilize, and seed the erosion control blanket areas before placing the blanket. Handle and place it following the manufacturer's recommendations. If recommendations are not provided, install as follows:

1. In ditches, unroll the blanket downstream and lap 4-inches (105 mm) over the adjoining blanket. Bury the ends and edges to prevent water and wind undercutting.
2. On slopes, the blanket may be unrolled horizontally or vertically to the slope, then lapped 4-inches (105 mm) over the adjoining blanket and stapled as above. Always lap the blanket in the direction of flow.

610.04 METHOD OF MEASUREMENT.

610.04.1 Topsoil. Topsoil is measured by the cubic yard (cubic meter) of loose material level with the haul vehicle box at the point of use on the project. Strike or level loads when directed.

610.04.2 Seeding. Seeding is measured by the acre (hectares), parallel to the ground surface, to the nearest 0.1 acre (0.1 ha).

610.04.3 Fertilizing. Fertilizing is measured by the acre (hectares), parallel to the ground surface, to the nearest 0.1 acre (0.1 ha).

610.04.4 Condition Seedbed Surface. Condition seedbed surface is measured by the acre (hectare), parallel to the ground surface, to the nearest 0.1 acre (0.1 ha).

610.04.5 Mulch.

- A. **Vegetative Mulch and Wood Cellulose Fiber Mulch.** Vegetative mulch and wood cellulose fiber mulch is measured by the acre (hectare), parallel to the ground surface, to the nearest 0.1 acre (0.1 ha).
- B. **Fabricated Mulch and Netting.** Fabricated mulch and netting is measured by the square yard (square meter) in place.
- C. **Bituminous Mulch.** Bituminous mulch is measured by the gallon (Liter) for the gallons (liters) applied at the specified rate.

610.04.6 Sodding. Sodding is measured by the square yard (square meter) in place, parallel to the ground surface.

Re-sodded areas damaged from causes not the fault of the Contractor are measured for payment.

610.04.7 Soil Retention Blanket. Soil retention blanket is measured by the square yard (square meter) in place.

610.05 BASIS OF PAYMENT. Payment for the completed and accepted quantities is made under the following:

<u>Pay Item</u>	<u>Pay Unit</u>
Topsoil	Cubic Yard (Cubic Meter)
Seeding	Acre (Hectare)
Fertilizing	Acre (Hectare)
Condition Seedbed Surface	Acre (Hectare)
Mulch	Acre (Hectare)
Fabricated Mulch and Netting	Acre (Hectare)
Sodding	Square Yard (Square Meter)
Soil Retention Blanket	Square Yard (Square Meter)

Payment at the contract unit price is full compensation for all resources necessary to complete the item of the work under the contract.